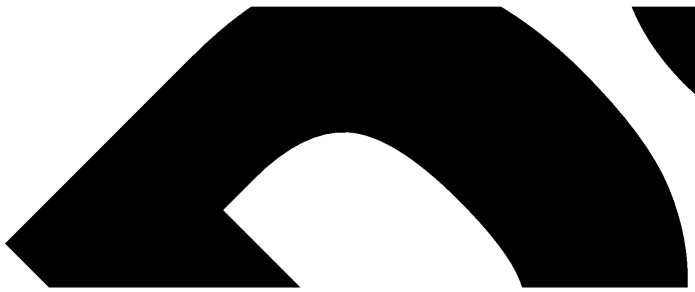

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DIRECTORATE OF
INTELLIGENCE

Intelligence Memorandum

Petroleum In North Vietnam At The Outset Of 1971: A Review Of Developments During 1970

Secret

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April 1971

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CENTRAL INTELLIGENCE AGENCY
Directorate of Intelligence
April 1971

INTELLIGENCE MEMORANDUM

PETROLEUM IN NORTH VIETNAM AT THE OUTSET OF 1971: A REVIEW OF DEVELOPMENTS DURING 1970

Introduction

1. North Vietnam has no indigenous sources of crude petroleum and no petroleum refining capacity. In order to support its military activities throughout Indochina and to sustain its domestic economy, North Vietnam has been forced to import, store, and distribute a considerably greater quantity of petroleum products than had been the case before the war intensified in 1965. This memorandum examines the level, types, and origin of petroleum imports during 1970; the developments affecting petroleum, storage, and distribution facilities during the year; and the state of the North Vietnamese petroleum economy at the outset of 1971.

Discussion

Petroleum Supply and Demand

2. North Vietnam imported about 375,000 metric tons of petroleum products in 1970, only slightly less than the amount imported in 1969. As in earlier years, about half of the petroleum products consisted of diesel fuel, about 40% gasoline, and the remainder kerosine, lubricants, and a variety of speciality products. The total value of these imports was about $11 million, based on world market prices during 1970.

Note: This memorandum was prepared by the Office of Economic Research and coordinated within CIA. It is the fourth in a successive series of annual reports reviewing petroleum developments in North Vietnam.

3. Monthly imports were highly erratic during the year (see Table 1). A peak of 51,000 tons was reached in June, but in August deliveries dropped to only 4,000 tons, the lowest monthly level in five years. Although petroleum deliveries historically decline during the third quarter of the year, reflecting the diversion of Soviet tankers to the Northern Sea Route and coinciding with reduced demand in North Vietnam during the wet season, the seasonal change was more pronounced in 1970 (see the chart).

4. Consumption of petroleum products in 1970 is estimated to have been about 384,000 tons, or an average of 32,000 tons per month, essentially the same as in recent years. It is not possible to allocate consumption precisely to type of product or to consuming sector. However, the military and the civil transport sectors had been the main consumers of petroleum products in the past, and it is likely that these sectors have consumed as much as 85% of the total petroleum imports during the last three years. North Vietnam's small industrial sector has traditionally relied primarily on indigenous sources of coal rather than imported petroleum products for its energy needs. Household demands for fuel are small and are primarily met by indigenous sources of wood, charcoal, and coal. The small amount of imported kerosine probably was the only petroleum product destined for lighting and heating.

5. Constant consumption coupled with a slight decrease in total imports during 1970 resulted in a drop in North Vietnam's stocks of petroleum from the record level at the beginning of the year to an estimated 100,000 tons at the beginning of 1971 (see Table 2). This quantity represents a three-month supply at the current rate of consumption.

Petroleum Imports: Origin and Transport

6. The USSR has become almost the exclusive supplier of petroleum to North Vietnam in the last three years. It supplied 98% of the total seaborne petroleum delivered to North Vietnam in 1970 (see Table 3), compared with 89% in 1969 and 77% in 1968. China's share of deliveries declined to only 2% in 1970 from 6% in 1969 and 18% in 1968. Eastern Europe has never supplied more than a small share of North Vietnam's petroleum imports.

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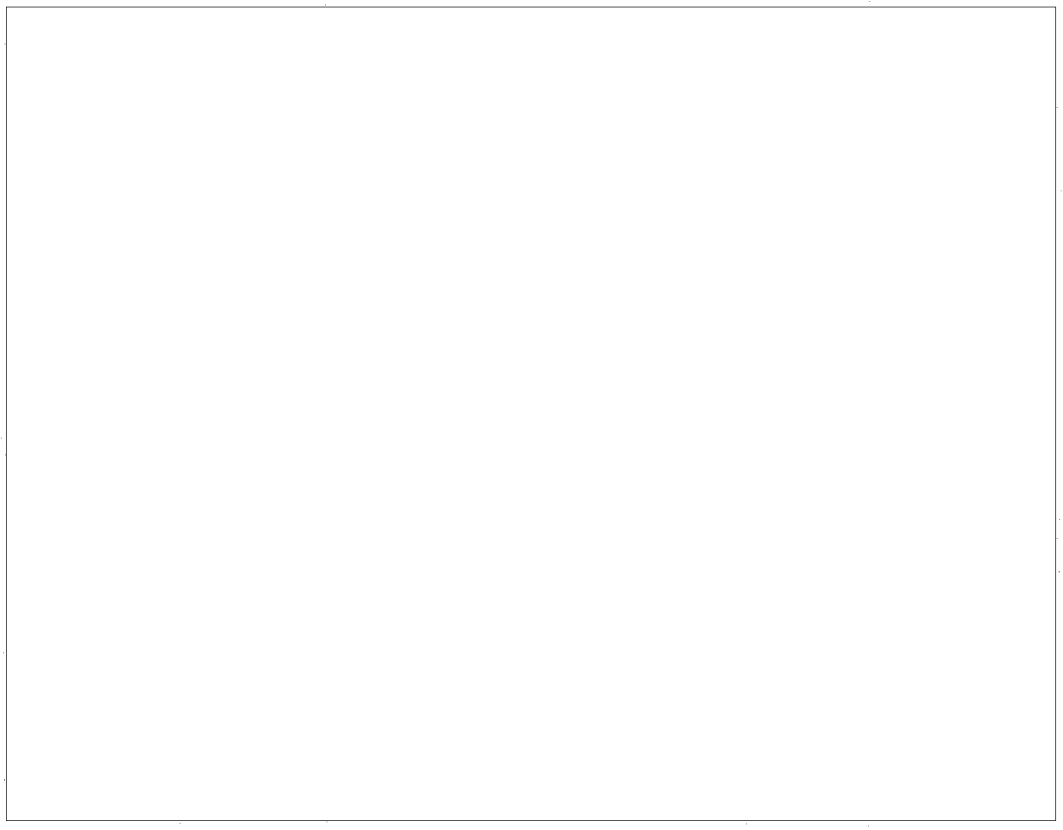

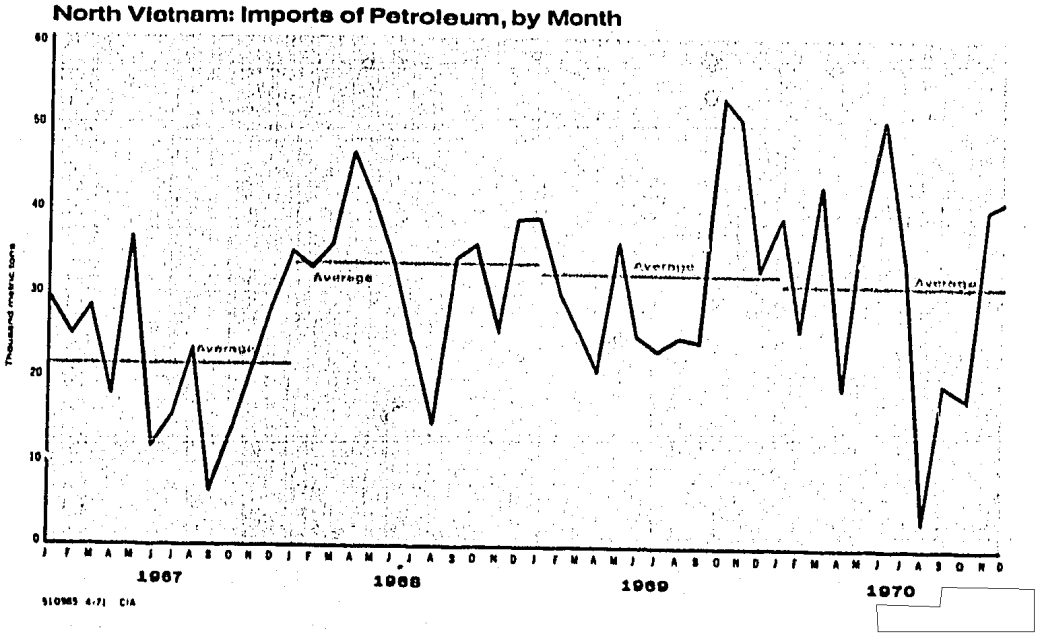

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Table 2

North Vietnam:
Petroleum Supply and Demand

Thousand Metric Tons

	1968	1969	1970
Stocks on hand, 1 January	65	104	109
Imports	402	389	375
Total supply	467	493	484
Less total demand	363	384	384
Consumption	360	384	384
Losses	3	Negl.	Negl.
Stocks on hand, 31 December	*104*	*109*	*100*

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8. During the first three months of 1971, the USSR continued its high level of petroleum deliveries to North Vietnam. Communist China's seaborne exports of petroleum products to North Vietnam over this period rose to 11,000 tons, almost twice the total for all of 1970. About 7,000 tons of the petroleum from China during the first quarter of 1971 arrived

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10. Little information is available on petroleum deliveries to North Vietnam by rail. What information exists suggests that rail shipments are composed primarily of small quantities of lubricants and specialty products carried in drums and other small containers. Rail deliveries amounted to perhaps 14,000 tons in each of the last two years.

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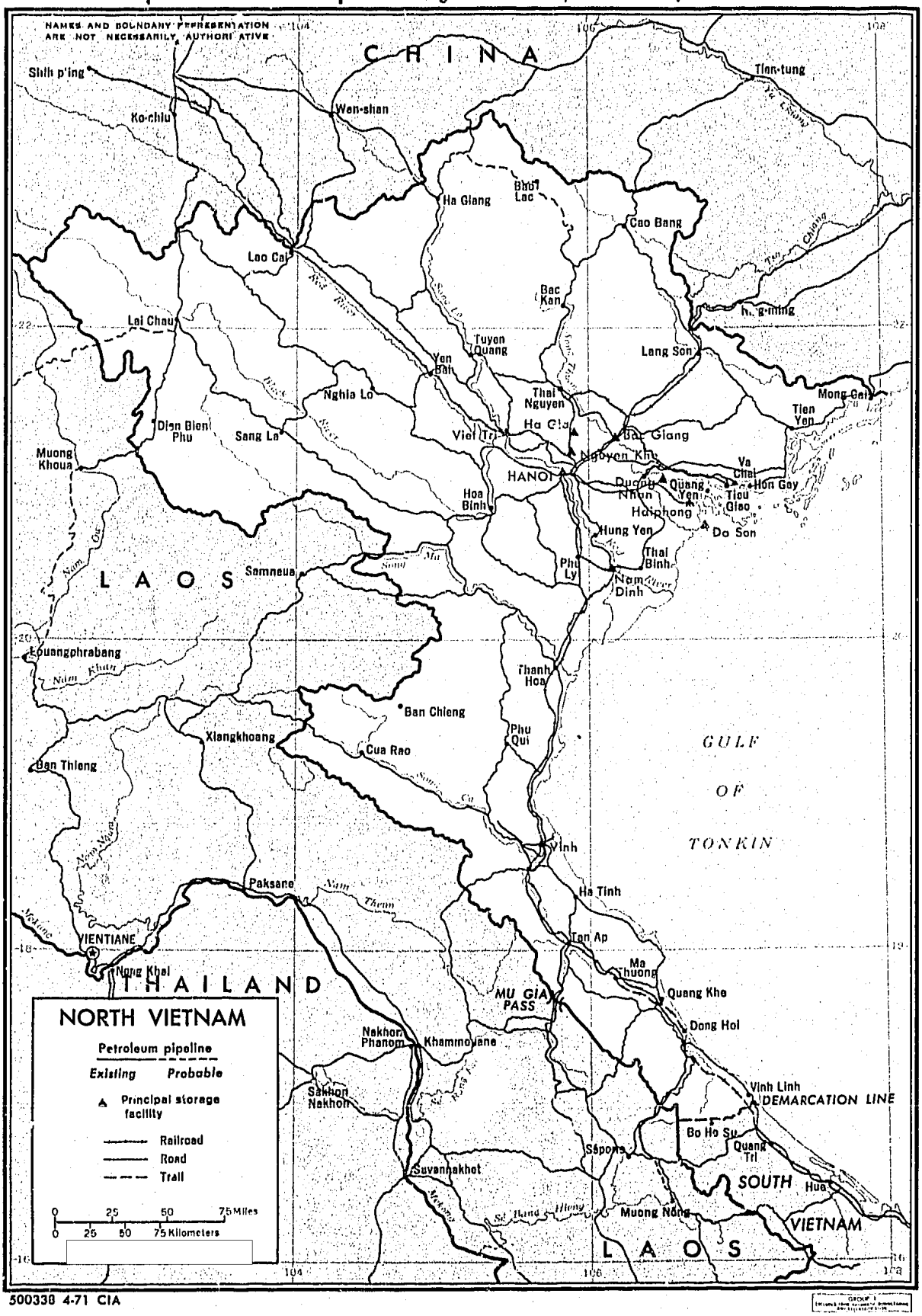
It is possible that undetected railborne deliveries of such a magnitude have occurred regularly in the past. If so, the level of rail deliveries to North Vietnam and therefore the level of total imports have been consistently underestimated. However, the apparent increase in railborne petroleum deliveries coincides with an observed increase in seaborne petroleum deliveries from Communist China, and both would seem to suggest an increased participation on the part of the Chinese in support of North Vietnam.

Pipelines

11. North Vietnam's petroleum pipeline network was extended and improved substantially in 1970. The main north-south system, first observed in mid-1968, extends from Vinh through the Mu Gia Pass some 30 miles into Laos. This system was linked within North Vietnam in late 1970 or early 1971 to another system extending in a westerly direction from Quang Khe into the southern Laos Panhandle just west of the DMZ (see the map). This linkage enhanced North Vietnamese flexibility to support military activity in Laos, Cambodia, and South Vietnam. The North Vietnamese now have a reasonably secure capability to distribute petroleum from the main input point at Vinh into Laos through either the Mu Gia Pass or the western DMZ corridor. The western DMZ entry corridor also can be supplied from the smaller terminus at Quang Khe.

Petroleum Pipelines and Principal Storage Facilities, 1 January 1971



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12. This southern pipeline system has an estimated length of more than 250 miles and a throughput capacity of over 1,000 tons a day. This capacity is equal to total nationwide consumption and is far in excess of present needs in the area. The pipeline system frees a substantial number of trucks that would otherwise be needed to move petroleum into the Laotian Panhandle and considerably reduces the vulnerability of the petroleum system to bombing and adverse weather.

13. Construction of a new dual petroleum pipeline system above the 19th parallel to serve the port of Va Chai, across the Cua Lac channel from Hon Gai, was first observed in 1970. The system now extends westward from Va Chai for about 30 miles to a point just across the Song Da Bach River (see the map). The eventual western terminus is unknown, but the alignment suggests it may be Hanoi. The construction techniques used for this line indicate a more permanent system than the southern lines. The Va Chai lines are being buried in parallel trenches and the pipe sections apparently connected by threaded couplings or by welding. The diameter of the line appears larger than the 4-inch pipe used in the Panhandle, and it is likely that the line pipe used is the 6.3-inch diameter pipe imported in large quantities from Japan in late 1969. The dual lines are probably designed to transport simultaneously dissimilar types of petroleum products – for example, motor gasoline and diesel oil. It would appear that the Va Chai/Hon Gai area is destined to become a major petroleum importing point in North Vietnam as an alternative to Haiphong.

Storage

14. The pace of reconstruction in 1970 of damaged and destroyed petroleum storage facilities slowed considerably from the level of 1969. No new major efforts to reconstruct the large petroleum storage tanks that had been destroyed during the US bombing campaign were observed. The North Vietnamese concentrated instead on emplacing more small underground tanks. The estimated storage capacity on 1 January 1971 exceeded the total that was available in North Vietnam prior to the bombings.* The accompanying tabulation summarizes the changes in storage capacity in recent years.

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* *At the start of 1966 the principal storage terminals had an estimated capacity of about 100,000 tons, and dispersed tanks and containers represented a limited storage capacity at best.*

	Capacity as of 1 January (Thousand Metric Tons)		
	1969	1970	1971
Principal storage terminals	17	38	49
Dispersed storage			
Tanks	50 to 60	70 to 80	75 to 85
Drums	55 to 65	75 to 85	80 to 90
Military and industrial sites (tanks)	5	5	5
Total	*127 to 147*	*188 to 208*	*209 to 229*

15. Petroleum storage is seldom used at 100% of capacity even for short periods of time. On the basis of military and civilian experience, the practical limit on the use of tank capacity is about 75%, and on drum capacity about 50%. North Vietnamese storage capacity used in such a manner would accommodate between 137,000 and 149,000 tons of petroleum – more than four months of supply at recent rates of consumption. Storage represented by trucks, rail tank cars, and barges would accommodate an additional supply.

Principal Storage Terminals

16. Storage capacity at the principal terminals increased by about 30% in 1970, principally by the addition of small, horizontal tanks. At the beginning of 1971, total storage at these terminals was about 49,000 tons, slightly less than half of the capacity existing on 1 January 1966, before the bombing. Table 4 shows the estimated capacities at these terminals at the outset of recent years. There is evidence that reconstruction of the large, vertical tanks at the Haiphong terminal was under way early in 1971, following suspension of such a program during 1970.

Dispersed Storage Sites

Tanks

17. The elaborate system of storage tank sites – consisting of widely scattered groups of small horizontal metal tanks buried in shallow excavations and covered with earth – that had been developed before the bombings of 1966 was still being modified and expanded during 1970. The

Table 4

North Vietnam: Locations and Estimated Capacities of Principal Petroleum Storage Terminals

JCS Target Number	Name	Coordinates		Capacities as of 1 January (Metric Tons)			
		North	East	1966	1968	1970	1971 a/
	Haiphong	20 52	106 39	40,620	430	9,800	12,700
	Hanoi	21 03	105 53	30,620	0	7,300	8,500
	Vinh	18 40	105 53	1,350	1,350	2,500	5,300
	Nguyen Khe	21 10	105 51	7,500	5,000	7,800	7,800
	Ha Gia	21 16	105 50	9,910	7,720	7,720	9,800
	Bac Giang	21 16	106 11	2,260	1,520	1,900	1,900
	Nam Dinh	20 25	106 11	0	0	500	2,900
	Do Son	20 42	106 47	2,860	0	0	0
	Viet Tri	21 17	105 26	1,400	20	20	20
	Duong Nham	21 01	106 30	4,130	0	0	0
	Total			*100,650*	*16,040*	*37,640*	*48,920*

a. Capacities shown reflect the addition of large vertical welded-steel tanks as well as small horizontal tanks.

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dispersed and concealed nature of these sites, together with changes that occur as some sites are abandoned and their tanks moved to other locations, make an accurate estimate of total capacity of these storage facilities extremely difficult. Photography reveals at least 200 such storage sites [redacted] This system is estimated to have had a storage capacity of between 75,000 and 85,000 tons on 1 January 1971, an increase of about 5,000 tons during 1970. About one-half of the 1970 increase was installed above the 21° parallel. The other half has been installed below the 18° parallel in concert with the extension of the southern section of the pipeline and the continued expansion of the storage and distribution outlets in the Pa nhandle following the suspension of bombing. New storage sites with an ultimate capacity of about 5,000 tons were under construction at Tieu Giao, probably to serve the new Va Chai pipeline system north of Haiphong. The dispersed site at Can Thon that was abandoned after the bombings in 1966 was partly restored in 1970. Distribution of the dispersed storage tank sites by latitude cross section is shown below.

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	Capacity			
	As of 1 January 1971		As of 1 January 1970	
Location	Thousand Metric Tons	Percent of Total	Thousand Metric Tons	Percent of Total
Above 21°	25	31	23	31
Between 20° 59' and 20°	16	20	16	21
Between 19° 59' and 19°	6	8	6	8
Between 18° 59' and 18°	16	20	16	21
Between 17° 59' and 17°	17	21	14	19
Total	*80* a/	*100*	*75* a/	*100*

a. Totals represent the midpoint of the estimated range of capacity.

Drums

18. Containers of various small sizes (expressed in terms of 55-gallon drum equivalents) continue to be used extensively in North Vietnam for the storage and distribution of petroleum. At the outset of 1971 there were probably the equivalent of about 550,000 drums, representing an increase in capacity from 75,000-85,000 tons to 80,000-90,000 tons in North Vietnam.* It is likely that most, if not all, of these containers will be used for storage and distribution of petroleum. An undetermined number of containers are used to carry the petroleum dispatched by the North Vietnamese to support the Communist war effort throughout Indochina. A large percentage of these drums probably never find their way back to North Vietnam, and therefore the estimate of drum storage available within North Vietnam probably errs on the high side.

Other Storage

19. The capacity of the bulk petroleum storage facilities at military and industrial installations remained unchanged at about 5,000 tons. It is not possible to estimate the sizable "floating" storage capacity represented by barges, rail tank cars, and tank trucks in North Vietnam, but there is nothing to suggest that this form of storage has changed significantly during the last year. The operational pipeline system is another form of storage and could hold about 2,000 tons when filled.

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[redacted]

* *The drum equivalent inventory is based on the tonnage of petroleum shipped to North Vietnam in containers on dry cargo vessels since the beginning of 1966, reduced by 15% annually to reflect estimated losses from attacks, normal use, and accidental destruction.*

Conclusions

21. North Vietnam's 1970 imports and consumption of petroleum products were little changed from the pattern established in recent years. The military and the civil transport sectors probably accounted for 85% of total petroleum demand, and gasoline and diesel fuel about 90% of the total supply. There was no evidence of petroleum shortage during 1970, and stocks on hand on 1 January 1971 were about 90 days of supply at current rates of consumption.

22. The USSR continued to supply almost all of North Vietnam's petroleum imports. There is new evidence that Communist China, which supplied only nominal quantities of petroleum last year, will increase its share of the supply somewhat this year.

23. Two previously independent pipeline systems, one extending from Vinh through the Mu Gia Pass into Laos and the other extending from Quang Khe and entering Laos just west of the DMZ, have been joined into a single grid. This provides North Vietnam with an integrated distribution facility secure from interruption because of bad weather and releases trucks from the transport of oil to other services. Construction proceeded in 1970 on a new pipeline system in the north with Va Chai near Hon Gai as one terminus and Hanoi as the likely other terminus. The new system may be developed as an alternative to Haiphong as an oil import facility. There was a moderation of the increase in storage capacity in 1970, probably reflecting the stabilization of North Vietnam's petroleum supply and demand.